Center for Scientific Review
Center for Scientific Review Advisory Council Meeting
National Institutes of Health
U.S. Department of Health and Human Services

October 25, 2011

The Center for Scientific Review Advisory Council (CSRAC) convened at 8:00 a.m., Tuesday, October 25, 2011, at the Health and Human Services Building, 5635 Fishers Lane, Rockville, MD. The entire meeting was held in open session. Dr. Richard Nakamura presided as chair.

Members Present

Bruce Alberts, Ph.D.
Etty N. Benveniste, Ph.D.
John T. Cacioppo, Ph.D.
Alice M. Clark, Ph.D.
Marie A. Krousel-Wood, M.D., M.S.P.H.
Peter R. MacLeish, Ph.D.
Andrew W. Murray, Ph.D.
Richard K. Nakamura, Ph.D.

Cheryl A. Kitt, Ph.D., was the executive secretary for the meeting.

I. Welcome and Introductions

Dr. Cheryl Kitt welcomed attendees to the second meeting of the CSRAC and turned the floor over to acting CSR director Dr. Richard Nakamura. CSRAC members introduced themselves.

II. Overview of Peer Review at NIH

Deputy Director for Extramural Research (DDER) Sally Rockey, Ph.D., presented an overview of peer review at NIH, with a focus on how policies related to peer review are formulated and how the Office of Extramural Research (OER) and CSR interact.

NIH Governance

Dr. Rockey highlighted the governance structure that affects peer review:

- ***NIH Steering Committee***: Chaired by the NIH Director, this committee consists of a representative group of Institute and Center (IC) directors. The Extramural Activities Working Group (EAWG) is included in the steering committee. Among other responsibilities, the EAWG oversees the CSR budget development process.

- ***Advisory Committee to the Director (ACD):*** Made up of distinguished members of the scientific community and other members of the public, the ACD ran the recent "review of peer review" process. It oversees the Working Group on Diversity in the Biomedical Research Workforce and Stem Cell Working Group, among other efforts.

- ***CSR Director and DDER:*** The CSR director is a member of the EAWG but reports to the NIH director. Ultimate responsibility for trans-NIH peer review policy falls to the DDER. The CSR director and DDER work together closely.

Office of Extramural Research
OER provides the corporate framework for NIH research administration, ensuring scientific integrity, public accountability, and effective stewardship of the extramural research portfolio. It develops policies for the extramural research program, including peer review policies across all Institutes and Centers (ICs). The Extramural Program Management Committee (EPMC), a Review Policy Officer, and the Review Policy Committee (RPC) advise the DDER. Dr. Rockey noted CSR has representation on the RPC and EPMC.

Recent EAWG activities have included—
- Clarifying definitions of impact and significance in enhanced review criteria
- Resolving conflicts of interest for applications from intramural investigators
- Handling increasing capacity in peer review
- Developing a compendium of peer review styles

CSR and OER work together on such policies as continuous submission. A recent example is where OER and CSR worked together was in conducting peer review for a program for the Internal Revenue Service and in the future for the Patient-Centered Outcome Research Institute (PCORI).

Biomedical Workforce Working Group
The focus of this ACD working group is on a "model for a sustainable and diverse U.S. biomedical research workforce." The group has collected data and will have an interim report in December and a final report in January. Changes in the workforce will have an impact on peer review in the future. (This topic was addressed later in the agenda.)

Discussion Highlights
- ***How does CSRAC relate to the other groups involved in peer review decisions?*** In response to a question from Dr. Bruce Alberts, Dr. Rockey said issues in CSR often drive changes across NIH, since CSR handles the majority of applications. She suggested CSRAC discuss both CSR-centric and trans-NIH peer review issues. She asked members to think about ways to holistically evaluate peer review continuously.

III. Goals for the Next Year

Dr. Nakamura said he is honored to serve as the acting CSR director. He recognized and thanked former director Dr. Toni Scarpa for his leadership and contributions to NIH in increasing efficiency and in focusing on review processes.

Fulfilling the NIH Mission
- ***Central role of peer review:*** Dr. Nakamura stressed the central role of review of applications submitted by extramural scientists. CSR reviews about 65,000 of the 80,000

applications received annually, and the prioritization of those applications for science is the single most critical step for the award of grants at NIH. The process requires efficiency and efficacy.

- ***Changes and improvements:*** While the NIH review process has generated and maintained a productive scientific pipeline that is the envy of the world, the need for continuous improvement and doing more with less can sap reviewer and staff morale and has made constructive change more important.

Acting Director's Goals

Dr. Nakamura listed his goals for the year:

- ***Improve morale of staff and reviewers***: It is important to remind them of the mission and the critical role they play, as well as to remind the rest of NIH of CSR's contributions.

- ***Maintain efficiency and increase the efficacy and quality of reviews***: As CSRAC will discuss, CSR needs to see whether changes are helping or hindering review. There is a need to evaluate committees to ensure they are all working well to produce good reviews.

- ***Support the search for a permanent CSR director***: NIH Director Collins has appointed co-chairs of a search committee. CSRAC members can forward suggestions for committee members to the co-chairs.

Dr. Nakamura said he would like to recognize CSR staff's extra effort, for example, in reviewing about 1,000 extra grant applications through PCORI. It is also important to ensure that Scientific Review Officers (SROs) continue their training to keep up with the science reviewed in their study sections. A mechanism is needed so the most talented staff can advance and the small minority no longer performing at peak level has an alternative career path.

He concluded by stressing efficiencies and speed must be balanced with crucial scientific judgment in review committees to determine what works best in the long run for science.

Discussion Highlights

- ***Quality of review teams:*** Dr. Alice Clark said the review process links NIH staff with volunteers from the community, and an important focus is to ensure these teams are the best they can be. Dr. Nakamura agreed and said SRO committee management includes ensuring scientists who serve feel that what they are doing is rewarding. SROs who can generate a feeling of collegiality help create strong committees, which also makes it easier to recruit other strong scientists to serve as reviewers.

- ***Role of the chair:*** Dr. Alberts also pointed to the central role of the committee chair and asked how they are selected and evaluated. Dr. Nakamura explained the process and the involvement of SROs, IRG chiefs, and division directors. He said perhaps metrics can be developed to help measure committee performance.

- ***In-Person versus technology-assisted meetings:*** Dr. Etty Benveniste observed the interaction in a face-to-face meeting is important and asked about any data to compare in-

person, phone, and Internet reviews. Dr. Nakamura said CSR is looking at how to study this. Dr. Alberts said in his experience, a committee needs to meet in person at least the first time. Dr. John Cacioppo said in-person meetings elevate the level of the review and enhance the experience for reviewers. Dr. Marie Krousel-Wood said understanding the outcomes of different review processes is critical and affects the morale of NIH and the investigator community.

- ***Serving on committees:*** Dr. Murray said some scientists have lost sight of the public service aspect to serving on a committee, and the question of negative incentives was raised. When Dr. Nakamura informally polled the SROs in the room, most did not favor negative incentives, but agreed they know of individuals who do not feel obliged to serve on committees, even when they have received NIH-funded grants.

- ***Effect of funding levels:*** The low funding line contaminates the process, said Dr. Peter MacLeish, by elevating some criteria, such as approach, over others, such as significance and impact. Another effect is to increase the number of applications an investigator submits to increase the possibility of funding. Dr. Alberts asked if NIH has considered restricting the number of applications per principal investigator (PI), perhaps a certain number every five years. Dr. Nakamura said the issue is revisited periodically, but the NIH has held scientists should be allowed to let the best ideas speak. He said Dr. Collins had data to show reducing the number of awards a PI is allowed has a relatively small effect on the pay line. Dr. Benveniste said she and others discourage faculty from submitting a grant every cycle, because the applications are not high quality. She also asked if some study sections have seen a drop in the number of applications. Dr. Nakamura said the overall number seems to be leveling off. He said he would work with staff to come up with some ideas about guidelines on the number of applications one can submit, recognizing that this is not a decision CSR can make.

- ***Stating one's funding in applications:*** Related, said Dr. Alberts, is that grant money seems unevenly distributed. In the 1980s, applications included how much money the PI was already receiving from NIH, which helped in judging productivity. He recommended reinstating the information. Dr. Murray strongly concurred and said not knowing this background discriminates against scientists who run small, high-quality operations.

- ***Taking on new programs:*** Given the already high workload, Dr. Cacioppo asked why CSR agreed to take on additional reviewing loads, such as for PCORI. Dr. Nakamura said the staff is mission-oriented and wants to help.

IV. Evaluation of Enhancing Peer Review

Dr. Della Hann, Deputy Director, Office of Extramural Research, presented on behalf of herself and Dr. Luci Roberts, Director, OER Office of Planning and Evaluation.

She began by noting that the Enhancing Peer Review initiative was designed to engage the best reviewers, improve the quality and transparency of reviews, and ensure balanced and fair

reviews across scientific fields and career stages. A survey was issued in FY 2009 to assess the results to date.

Phase I Survey

- ***What was covered:*** The 1-9 scoring range, criterion-based scoring, bulleted critiques, the structured critique template, enhanced review criteria, and clustering of clinical and new investigator applications.

- ***Method:*** Applicants, reviewers, SROs, Program Officers (POs), and Advisory Council members were surveyed after the changes took effect.

- ***Positive findings:*** Reviewers indicated that the 9-point scoring range was adequate for scoring applications, and Advisory Council members indicated that the scoring range was easy to understand. POs rated the criterion scores as one of the changes most helpful for advising applicants, and reviewers identified clustering as a positive change. Dr. Hann provided findings broken out by type of respondent.

- ***Items Worthy of Further Attention***: Dr. Hann said respondents rated some other areas less highly. While reviewers rated the structured critiques as more efficient than the previous narrative format, they also said the bulleted critiques were not as helpful for understanding the factors that affect the review outcome. POs and SROs strongly disagreed, more often than they agreed, that the enhanced review criteria provided greater clarity about an application. Most applicants said the summary statements are not helpful in understanding why the review group did not discuss their application. She said bulleted critiques need to be enhanced, especially for applications that are not discussed.

- ***New system versus old***: There was no clear-cut preference between the old and new systems by reviewers and SROs. Advisory councils tended to prefer the new system and POs, the old. Reviewers felt the newer system is not as strong in terms of fairness. In terms of overall satisfaction, the results were mixed.

- ***Factor analysis of criterion scores:*** An analysis of over 50,000 scored research grant applications showed the criteria loaded on two major factors: Significance, innovation, and approach loaded on the first factor, and investigator and environment loaded on a second factor. The most significant predictors for the impact score and for funding are approach, significance, and, to some extent, innovation.

Phase 2 Survey

NIH will conduct a second phase of surveys between now and spring 2012 to look at shortened applications, realignment of the application format with review criteria, elimination of the A2, and two interventions introduced as a result of the first wave of survey results: the narrative overall impact paragraph, and clarification of impact versus significance. Several questions from the first phase will be repeated in order to assess changes in response over time.

Funding Distribution

Dr. Hann concluded with data slides about funding. While the average number of awards per PI has not increased dramatically, distribution is more dramatic: 20 percent of PIs receive about 50 percent of awarded dollars. Moreover, about 20 percent of institutions, many of which are medical schools, receive about 80 percent of NIH funding.

Discussion Highlights

- ***Instructions to reviewers***: Dr. MacLeish asked about instructions to reviewers to develop the impact score. Dr. Sally Amero, Ph.D., OER review policy officer, said reviewers receive written instructions, and several videos are available. Dr. Scarpa also regularly met with study section chairs.

- ***Role of approach in a review outcome***: Dr. MacLeish expressed concern about approach as a dominant factor. Dr. Hann said it was an unexpected finding and merits further examination. Dr. Krousel-Wood said, however, an idea could be significant and innovative, but if the approach cannot deliver, then the application is problematic. Dr. Alberts said young researchers avoid putting anything risky in grants, given their concern about review outcomes. Dr. Murray questioned if perhaps reviewers and NIH are on a feedback loop that emphasizes tractability.

Applications per person: Dr. Alberts asked about data that show the number of all applications submitted by an investigator, including as part of a program grant. Dr. Hann said data are available by institution, not by individual, but could be developed. Dr. Clark said data on the number of submissions, not just awards, is important. CSRAC had discussion about the pros and cons of limiting the number of submissions per investigator, but acknowledged the need for data before recommending any course of action. Dr. MacLeish said he was concerned new people cannot get into the pipeline. Dr. Hann pointed to a few programs aimed at early stage investigators.

V. General Discussion

Time was set aside in the agenda for general comments and questions from CSR staff and the Council. They covered a variety of topics.

- ***Review formats***: An SRO commented that, while face-to-face meetings are ideal, circumstances sometimes require telephone or Internet-assisted meetings, such as a tight timeline or the need for a special emphasis panel (SEP) to review only a handful of applications.

- ***Negative measures***: Picking up on the earlier discussion about how to treat investigators who do not serve on committees, an SRO pointed out a related issue: Reviewers who participate very sporadically but still expect the benefit of continuous submission.

- ***Reviewer training***: This SRO also noted SROs spend a lot of time training study section members at various stages. She said they stress the need to focus on impact and

significance. An IRG chief said reviewers received slides and the SROs set up teleconferences for orientation to the Enhancing Peer Review changes.

- ***Scoring***: An SRO expressed concern about what she sees as an inherent negativity bias in the scoring system, particularly in that criteria scores are supposed to be considered together as a gestalt. Dr. Cacioppo said he has not see data to date that evaluate the relationship between the approach score and significance and impact.
- ***Translational versus basic science***: Dr. Benveniste said many faculty perceive NIH is interested in translational as opposed to basic science. Dr. Nakamura said he recognizes the concern within the basic science community, but support rates indicate basic science applications are holding up. Dr. Murray said he was worried about what he termed an anticipatory evolution phenomenon: even without a policy change, people think NIH is moving money in the direction of translational research and, thus, start writing more translational and fewer basic science applications. An SRO replied in two recent basic science study sections, he did not see a decrease in basic science applications. Another SRO whose study section covers clinical, translational, and basic science said there is some tension among reviewers about future directions.

- ***Publication lists***: An SRO commented the limit of the 15 most relevant publications on an application prevents an accurate reflection of a PI's productivity. He suggested they be able to list all publications within the past three years. Dr. Amero said although a limit of 15 is recommended, applications that list more than 15 are not turned back.

- ***Broadening study sections***: In response to a question from Dr. Alberts, an SRO said his study section looks at a number of model organisms. There has not been a drop-off, but more investigators are shifting their emphasis to translational topics.

- ***Early investigators and the A2***: An SRO expressed his view that taking away the A2 for a new investigator is a penalty for him or her.

- ***Reviewer workload***: In answer to a question from Dr. Krousel-Wood, an IRG chief said the metrics have varied about how many applications should be assigned per reviewer. He stated, "We need the fewest number of reviewers for a thorough review,. In some cases, a reviewer can review 12 applications, but other applications require more intense review and a reviewer must take fewer or the review is compromised. Dr. Nakamura said an ongoing issue is the need for a central rule versus judgment by the professionals who run the committee.

VI. How Should CSR Study Sections Evolve to Meet the Needs of Science

In introducing Dr. George Chacko, Ph.D., Director of the CSR Office of Planning, Analysis, and Evaluation, Dr. Nakamura said Dr. Chacko is working on issues that would benefit from Council input, such as how study sections map onto science and how well they rank-order applications. The answers, said Dr. Nakamura, require a combination of judgment and metrics.

Dr. Chacko said his office is looking at quantitative approaches to support decision-making; develop a feedback loop to the CSRAC to solicit advice; and ensure strong feedback from Council, Programs, SROs, and the scientific community when new initiatives are implemented. Areas of active interest under these objectives are—

- Remodeling of IRGs and study sections to ensure fair and full coverage
- Developing metrics for high- and low-performing study sections
- Identifying and monitoring the developing and declining areas of science
- Optimizing the distribution of high-quality applications to study sections
- Developing appropriate evaluations of proposed changes.

He focused on three projects: optimizing application assignments, evaluating study section impact, and analyzing the CSR study section network against the larger biomedical enterprise.

Application ssignments in Silico

CSR has a carefully evolved manual system to assign applications to study sections, but has been testing software to assist with the task, with three experiments completed since the last CSRAC meeting:

- LIKE software was used to develop "fingerprints" of study sections based on applications assigned to them in one round of review, then using the fingerprints to search for similar applications in a different round. Using eight study sections in an initial test, the software generated a high false negative rate, i.e., it did not select applications which were historically assigned to the study sections of interest.

  A different technology developed by Heliotext was used in a second experiment. Rather than using keywords, similarity is based on text strings. The experiment involved a different set of study sections but a high false negative rate from the software was again recorded and the overall accuracy rate was significantly lower when compared to LIKE.

- A modified LIKE approach was used in the third experiment, and the test was run with 165 study sections. Applications that did not belong in a chartered study section were pre-filtered. The third experiment resulted in a very significantly enhanced rate of accuracy with roughly 80 percent accuracy in over half the study sections tested. (This experiment is currently being repeated with a different fingerprint and on more than one round of data.)

Under the conditions tested, the third approach is most promising, and the first two approaches are perhaps less useful. Refining the first two approaches may yield improvements, but the advantage of the third method is significant and further experiments will be based on it.

He concluded by saying the approaches, especially the last one, merit further study, although they are clearly not ready for deployment. Future work involves optimizing fingerprint generation and similarity searching, developing statistical confidence measures for these virtual assignments, and conducting more pilots.

CSR Scientific Review Group Network

Dr. Chacko explained a project to map study sections in the context of the current biomedical enterprise. Twenty-nine CSR study sections were positioned on a disciplinary Map of Science. Some corresponded to the domains expected, but others did not. He said much work is needed to understand the implications of these graphical representations.

Discussion

- ***Collaborating with academics***: Dr. Murray asked if CSR can collaborate with academics in the mapping field. Dr. Chacko said he plans to develop a symposium to bring together experts. Dr. Nakamura pointed out CSR collaborates with the NIH Division of Program Coordination, Program and Strategic Initiatives, which also has analysis capabilities.

- ***Quantitative approaches to support decision-making***: In response to a question from Dr. MacLeish, Dr. Chacko said CSR is debating what quantitative triggers could allow for decisions about new study sections. Dr. Nakamura said a look at bibliographic measures of impact showed a large variance among study sections. Judgment is needed to determine why and whether any action is needed. Dr. Nakamura said a few metrics have been developed but need refinement. He suggested a CSRAC work group on the topic.

VII. CSR Study Section Realignments

In introducing this portion of the agenda, Dr. Nakamura said the ongoing examination of study sections sometimes leads to suggestions to reform, re-create, or move portfolios around. Triggers for change include the growth or reduction in the numbers of applications going to a study section, feedback from the field, and apparent asymmetry of quality across review groups.

Proposed Reorganization of Three Cell Biology Study Sections

Dr. Don Schneider, Ph.D., director of the Division of Basic and Integrative Sciences, focused on three study sections within the Cell Biology IRG.

A review of these study sections suggested that perhaps too much high-quality science is clustered in three study sections—Membrane Biology and Protein Processing (MBPP), Nuclear and Cytoplasmic Structure/Function and Dynamics (NCSD), and, to a lesser extent, Cellular Signaling and Regulatory Systems (CSRS)—resulting in excessive competition. An external working group was formed, and the three study section chairs, program staff, and review staff were also consulted. The working group had leeway in its recommendations, with the limitations that a study section review 60–90 proposals and any other options would not reach outside the IRG.

The working group recommended:

- Three panels with identical guidelines to replace the three existing study sections;
- Transfer of members across the three to ensure equitable distribution of expertise, diversity, and other considerations;
- Broad topic guidelines for the major scientific areas that would go to the three sections.

The study section chairs supported some broadening, but expressed hesitation about dilution of expertise in each panel if the three had identical guidelines. They were concerned that smaller, very specialized areas would be better served if a single section reviewed all applications related to these areas. Dr. Schneider said the tentative plan is to broaden the scope of the three existing study sections, either partially (with significant overlap) or identically and transfer members across the three, with implementation in the fall of 2012.

Discussion

- ***Moving beyond the three study sections*:** Dr. Murray asked how this change would resolve the issue of too many high-quality applications reviewed by the existing study sections. He asked whether other study sections should be included. Dr. Schneider said the other study sections within the IRG deal with topics that are too distant. Reaching beyond the IRG could make it possible. Dr. Alberts agreed it was necessary to find a wider community to resolve the issue about too much competition in the long run. Dr. Clark said the amount of work and effort to change the guidelines seems warranted only if it is the right long-term solution. Dr. Alberts said this situation may apply to other study sections and perhaps a broader solution could be applied elsewhere. Dr. Cacioppo suggested a policy to ensure CSRAC receives reports when IRGs are reviewed, and Dr. Schneider confirmed that that is policy.

Realigning Activities in Population Sciences and Epidemiology

Dr. Karyl Swartz, director of the Division of AIDS, Behavioral and Population Sciences, discussed a proposed realignment of the Social Sciences and Population Studies (SSPS) study section. It has had a growing number of applications (120 to 140 per round, with an increasing trend), creating the need for an overflow SEP.

A working group considered three options and recommended two mirror-image study sections (SSPA and SSPB) with a staggered schedule. Next step are to develop guidelines and slates. The realigned study sections will first meet in September/October 2012.

Discussion

- ***CSRAC concurrence***: As expressed by Dr. Krousel-Wood, CSRAC concurred that mirror study sections with a staggered schedule represented a reasonable approach.

DNDA-ETTN Realignment: Neurotechnologies and Vision Technologies

Dr. René Etcheberrigaray, director of the Division of Neuroscience, Development, and Aging, described a potential realignment related to the Emerging Technologies and Training in Neurosciences IRG, which formed in 2008. Its mandate is to review all small business and fellowship applications assigned to the division,

In addition, two chartered study sections, Neurotechnologies and Molecular Neurogenetics, review more traditional mechanisms, some of which are technology-based or discovery-based and not necessarily hypothesis-driven. Neurotechnologies has grown to about 120 applications with two distinct main scientific areas that do not realy interact. A SEP also reviews about 25

vision technology applications per round—not enough for a study section but with the need for a review home.

As a pilot, they separated some Neurotechnologies applications into a SEP (with a concentration on imaging), which seemed to solve the issue of size and differing areas. A working group proposed recommended two study sections: Bioengineering of Neuroscience, Vision and Low Vision Technologies, and the Neuroscience and Ophthalmic Imaging Technologies

Discussion

- ***SEPs:*** While agreeing with the proposal, Dr. Alberts asked about the number of SEPs within CSR. Dr. Suzanne Fisher, Ph.D., director of the Division of Receipt and Referral, said SEPs are set up to meet different needs, including to review small business applications, fellowships, and clusters based on an Institute request. Only a few are set up because of overflows from study sections as described by the division directors.

VIII. Committee Discussion

The agenda allowed for additional discussion on a range of topics.

- ***Areas of concern***: Dr. Nakamura shared a list compiled by Dr. Kitt of the top areas of concern sent to CSR related to changes in peer review. These issues included the following: A2s, short applications and critiques, scoring criterion versus overall impact scores, Internet versus face-to-face meetings, reviewer assignment load, quality of reviewers and chairs of study sections, and appeals of review.

- ***Elimination of A2s***: Dr. Benveniste said, based on her conversations with colleagues, the abolishment of the A2 is the issue of greatest concern. Recognizing that decisions about the A2 are not within the purview of CSR, she urged a reinstatement or at least consideration for situations when the A1 scored well but did not receive funding. Dr. Alberts noted it is virtually impossible for a young investigator to start over if the A1 is not approved. But, he said, the previous system was also destructive, as data showed panels were waiting until the A2 to "get serious about a grant." Dr. Fisher said the issue of "virtual" new applications also arose (an application essentially the same as the previously unsuccessful one except for a new introduction) when A2s were permitted. She said reviewers get discouraged if they see the same application too many times.

- ***A2s in some circumstances***: Dr. Murray expressed support for allowing new investigators to submit an A2. Dr. Clark and Dr. Cacioppo also agreed, especially when reviewers clarify what the investigator needs to do to strengthen the application. Dr. Clark distinguished between applications that would not receive high scores no matter how many times reviewed versus those that have good scores but have not made the funding line. Dr. Nakamura said some data indicate early-stage investigators are reluctant to submit an A1. Dr. Clark said these applicants may feel a sense of futility, especially if the initial application was not discussed. She said the possibility of an A2 might help.

- ***Sense of Council***: There was some discussion about how best to convey the views of CSRAC to other NIH groups and committees. For the A2 in particular, Dr. Nakamura asked if the Council wanted to encourage NIH to consider an A2 option for early stage investigators, particularly if their applications were discussed at the A1 stage. Dr. Sherry Mills, director of the Office of Extramural Programs, commented the A2 issue has been discussed since Enhancement of Peer Review changes began, and will be evaluated. While the NIH leadership is aware of the concern, it is too early to have data about the effect, if any, on investigators and on areas of science. Any policy change will have to be an informed change, and collecting data on this issue is a high priority.

- ***Investigators in the pipeline*:** Dr. Mills said beginning with NIH Director Zerhouni, ICs have been encouraged to establish differential paylines for new and early stage investigators. Dr. Benveniste pointed out a possible result is that investigators get their first R01 and are brought into the pipeline, but then have difficulties obtaining their next award. Dr. Mills said OER is continuously analyzing the new and early stage investigator data to inform Dr. Collins and the IC directors on NIH behavior and the funding of these investigators.

- ***Data requests:*** Dr. Krousel-Wood concurred on the importance of data-driven decisions. In terms the A2, Dr. Nakamura suggested seeing the data that do exist and better understanding the baseline. Dr. Alberts agreed. Also, as discussed earlier in the agenda, he requested data on the total number of grants investigators are receiving, because it is hard to judge productivity without knowing an investigator's resources, including all NIH funding. Dr. Benveniste said other types of support, such as personnel, are also important. Dr. Nakamura pointed out NIH has a limited capacity to ask for details of an individual's history and support, but information about other federal support should be available.

- ***CSRAC work group***: Dr. Nakamura asked for volunteers to serve on a work group to focus on the how the study section structure covers the full range of science and is supporting outstanding science. He will also ask other members not in attendance.

- ***Application page length***: Dr. Alberts asked SROs for feedback about the shortened application. One SRO said reviewers she works with favor it. They say they have a better idea of what the application is about and can read it multiple times.

IX. Race, Ethnicity, and NIH Research Awards

Dr. Lawrence Tabak, NIH principal deputy director, discussed the task force on diversity in the biomedical workforce and issues related to review outcomes for underrepresented minorities.

Environmental Scan

Minorities, particularly Blacks and Hispanics, are underrepresented in the NIH-funded workforce, despite efforts over more than 30 years to improve the situation. One cause is the low number of underrepresented minorities going into science and engineering. For example, underrepresented minorities earn fewer than 500 PhDs in biology, chemistry, and physics each

year. NIH has a few programs related to K-12 education to encourage younger students to enter these fields, but this is not directly related to the NIH mission. NIH has also supports several programs at both the institutional and individual levels.

Dr. Tabak referred to a number of NIH-commissioned studies, most notably the study by Ginther et al. published in *Science* in August 2011 that analyzed the probability of securing first-time R01 funding considering race and ethnicity, controlling for other characteristics. Dr. Tabak summarized the study and its findings, as well as the NIH response.

NIH Action Items

NIH remains committed to a diverse biomedical workforce and is seeking out the causes in the disparities in success rates. It has also begun to take action, including—

- Engaging in rigorous communication to all stakeholders
- Supporting the expansion of the CSR Early Career Reviewers program, both to expose these investigators to the review process and to increase the diversity of review panels
- Exploring experiments to determine if implicit bias exists in the review process and how to eliminate it
- Supporting pre-application mentoring in institutions
- Funding extramural grants, including the NIH Pathfinder Award, to study interventions that might strengthen diversity
- Establishing two high-level groups, one internal and one external. The external group, the ACD Working Group on Diversity in the Biomedical Research Workforce, has met several times and will issue a preliminary report in December and will issue a final report in June.

Discussion

- ***Blinded studies*:** Several CSRAC members suggested possible ways to conduct blinded pilot studies. Dr. Tabak welcomed these and other suggestions.

- ***Best practices***: Dr. MacLeish emphasized the importance of the issue for the nation. He also noted that Morehouse School of Medicine's neuroscience institute has had an 83 percent success rate in early investigators obtaining R01s, albeit the small number of researchers might not represent a statistically significant picture. Reasons behind their success included that the researchers are strongly supported, know their value to the institute, and must meet high expectations. Dr. Nakamura said his experience at the National Institute of Mental Health underscored the importance of a key mentor or guide in an investigator's career. Dr. Alberts said it would be interesting to see whether the way people are mentored makes a difference. Dr. Benveniste said, while she hoped it was not the case, a dual system may exist in some places: tenured faculty mentored carefully, with non-tenure-track faculty not receiving such active mentoring.

- ***Study section experience***: Dr. MacLeish said a visit to a study section is transforming and vital to emergence as a successful applicant. Dr. Swartz, who is spearheading the Early Career Reviewer program, summarized the program. It involves faculty members who have an active research program but who have not reviewed for NIH before. CSR reached the initial goal to include an early career reviewer in about 50 percent of study

sections. They will collect feedback from SROs, but anecdotal feedback is very positive. After the *Science* article, more than 300 people self-nominated to add themselves to the early career reviewer database. Although there is no way to know the number who are minorities, Dr. Nakamura said he hoped the program can make a difference.

X. Final Discussions and Action Items

Dr. Nakamura summarized CSRAC action items:

- Establish a work group to focus on general issues of increasing the efficacy of study sections, to make sure the sections are providing accurate coverage of science, and to detect and improve lower-functioning and higher-functioning study sections.

- Continue to address the issue of disparities and other concerns about review, in close cooperation with others at NIH, to do the analyses about the problem and develop ideas about interventions.

- Have ongoing communication between CSR and CSRAC to develop data sets so members can provide guidance to improve the system. CSR will email Council members on data needs and set up a conference call to review them before the next meeting.

With no further comments or questions, Dr. Nakamura again thanked CSRAC for their participation. The meeting adjourned at 3:55 p.m.

We do hereby certify that, to the best of our knowledge, the foregoing minutes of the October 25, 2011, meeting of CSRAC are accurate and complete. The minutes will be considered at the next meeting of the Advisory Council, and any corrections or comments will be made at that time.

* signed by Kate Bent, Ph.D. for

_____

Cheryl Kitt, Ph.D.
Executive Secretary
Center for Scientific Review Advisory Council

* signed by Richard Nakamura, Ph.D.

_____

Richard Nakamura, Ph.D.
Chair
Center for Scientific Review Advisory Council